

ABSTRACT OF THE DISCLOSURE

A method for modifying a surface of a substrate to be processed, by utilizing microwave surface-wave plasma includes the steps of maintaining a temperature of the substrate to a temperature which substantially prevents a material injected by a plasma process into the substrate from diffusing in the substrate, and provides an anneal effect, introducing process gas including the material into a plasma process chamber, generating plasma in the plasma process chamber, and changing at least once an electron temperature of the plasma.